

Amendments to the Claims

Please amend the claims to read as follows.

1. (Currently amended): An optical switch assembly comprising:

- a fixed optical array;
- a movable optical array;
- a plurality of first optical fibers mounted on said fixed optical array and a plurality of second optical fibers mounted on said movable optical array; and
- a mounting apparatus comprising a plurality of mounting structures, wherein said fixed optical array is immobile relative to said mounting apparatus and said movable optical array is movable relative to said mounting apparatus along the direction of the optical axis of a selected one of said second optical fibers to an open switch position on the mounting apparatus wherein light transmitted from a selected one of said second optical fibers is deflected so that the deflected light is not received by said first fibers.

2. (Canceled.)

3. (Currently amended): ~~An~~ The optical switch assembly of claim 1, comprising:

- ~~a fixed optical array;~~
- ~~— a movable optical array;~~
- ~~— a plurality of first optical fibers mounted on said fixed optical array and a plurality of second optical fibers mounted on said movable optical array; and~~
- ~~— a mounting apparatus comprising a plurality of mounting structures, wherein said fixed optical array is immobile relative to said mounting apparatus and said movable optical array is movable along side mounting apparatus, and~~
- wherein said fixed optical array comprises an upper chip mated to a lower chip, said chips comprising grooves which mate to receive said first optical fibers and cut-in portions which create a notch between said upper and lower chips, and said movable optical array

comprises an upper chip mated to a lower chip, said chips comprising grooves which mate to receive said second optical fibers and cut-in portions which create a notch between said upper and lower chips.

4. (Original): The optical switch array of claim 3, wherein a pair of fibers are positioned in said notches, said movable optical array being movable along said fibers and said fixed optical array being affixed to said fibers.

5. (Canceled.)

6. (Canceled.)

7. (Currently Amended): ~~The optical switch assembly of claim 6,~~ An optical switch assembly comprising:

a fixed optical array comprising at least one chip with a plurality of first and second grooves;

a movable optical array comprising at least one chip with a plurality of first and second grooves;

a plurality of first optical fibers mounted on said fixed optical array and a plurality of second optical fibers mounted on said movable optical array, wherein said first grooves of said fixed optical array are adapted to receive said first optical fibers and said first grooves of said movable optical array are adapted to receive said second optical fibers; and

a mounting apparatus comprising a plurality of mounting structures, said fixed optical array being immobile relative to said mounting apparatus and said movable optical array being movable along said mounting apparatus, wherein said second grooves of said fixed optical array are adapted to receive said mounting structures and said second grooves of said movable optical array are adapted to receive said mounting structures, wherein said mounting structures comprise at least one member chosen from rails, fibers, and spheres and wherein said mounting apparatus comprises a substrate.

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8. (Original): The optical switch assembly of claim 7, wherein said rails are integral with said substrate.
9. (Original): The optical switch assembly of claim 8, wherein said rails have a rectangular profile.
10. (Original): The optical switch assembly of claim 8, wherein said rails have a semi-circular profile.
11. (Previously Presented): The optical switch assembly of claim 7, wherein said substrate comprises an opening.
12. (Original): The optical switch assembly of claim 11, wherein when said chips are mounted on said substrate, said first and second grooves are on a surface of said chips closest to said substrate.
13. (Original): The optical switch assembly of claim 7, wherein said substrate comprises a plurality of first grooves.
14. (Original): The optical switch assembly of claim 13, wherein said mounting structures comprise fibers affixed to said plurality of first grooves in said substrate.
15. (Original): The optical switch assembly of claim 13, wherein said mounting structures comprise a first plurality of spheres affixed to said first grooves in said substrate and a second plurality of movable spheres positioned within said first grooves in said substrate, said fixed optical array being mounted on said affixed spheres and said movable optical array being mounted on said movable spheres.

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16. (Previously Presented): The optical switch assembly of claim 7, wherein said substrate comprises a first plurality of grooves and a second plurality of grooves extending in a transverse direction to said first plurality of grooves.

17. (Original): The optical switch assembly of claim 16, further comprising first mounting structures positioned in said substrate first plurality of grooves, said fixed optical array being affixed to said first mounting structures.

18. (Original): The optical switch assembly of claim 17, further comprising second mounting structures in said substrate second plurality of grooves, said movable optical array being movable on said second mounting structures.

19. (Canceled.)

20. (Canceled.)

21. (Currently Amended): ~~The method of claim 20, further comprising preparing said mounting structures, including:~~ A method for making an optical switch assembly, comprising:
positioning a plurality of first optical fibers in a first support structure and a plurality of second optical fibers in a second support structure;
providing mounting structures located on at least one mounting apparatus comprising the steps of locating a plurality of grooves within a base structure,[[;]]
positioning a fiber within each said groove,[[;]] and affixing said fibers to said grooves;
mounting said first and second support structures on said at least one mounting apparatus, by positioning grooves, located on said first and second support structures, on said mounting structures; and
affixing one of said first and second support structures to said mounting apparatus.

22. (Previously Presented): The method of claim 21, wherein one of said first and second support structures is affixed to said base structure fibers.

23. (Currently Amended): ~~The method of claim 20, further comprising preparing said mounting structures, including:~~

A method for making an optical switch assembly, comprising:
positioning a plurality of first optical fibers in a first support structure and a plurality
of second optical fibers in a second support structure;
providing mounting structures located on at least one mounting apparatus comprising
the steps of locating a plurality of grooves within a base structure,[[;]]
positioning a first and a second plurality of spheres within said grooves,[[;]]
and affixing said first plurality of spheres to said grooves;
mounting said first and second support structures on said at least one mounting
apparatus, by positioning grooves, located on said first and second support
structures, on said mounting structures; and
affixing one of said first and second support structures to said mounting apparatus.

24. (Original): The method of claim 23, wherein one of said first and second support structures is affixed to said first plurality of spheres.

25. (Currently Amended): A method for making an optical switch assembly, comprising:
positioning a plurality of first optical fibers in a first support structure and a plurality
of second optical fibers in a second support structure;
mounting said first and second support structures on at least one mounting
apparatus, by positioning grooves, located on said first and second support
structures, on mounting structures located on said mounting apparatus. The
~~method of claim 20, wherein said mounting comprises[[;]]~~ positioning a pair
of fibers within cut-in portions of said first and second support structures[[;]]

and affixing one of said first and second support structures to said pair of fibers; and

affixing one of said first and second support structures to said mounting apparatus.

26. (Previously Presented): The method of claim 25, wherein said first and second support structures each comprise upper and lower support portions, each said portion comprising a pair of said cut-in portions, wherein said cut-in portions of said upper support portion mate with said cut-in portions of said lower support portion to create notches for receiving said pair of fibers.

27. (Currently Amended): ~~The method of claim 20, further comprising preparing said mounting apparatus, comprising:~~

A method for making an optical switch assembly, comprising:

positioning a plurality of first optical fibers in a first support structure and a plurality of second optical fibers in a second support structure;

providing mounting structures located on at least one mounting apparatus comprising the steps of providing a first plurality and second plurality of grooves in a base structure, said first plurality of grooves being transverse to said second plurality of grooves; positioning a plurality of mounting structures within said base structure grooves; and affixing one of said first and second support structures to said mounting structures in said first plurality of grooves in said base structure;

mounting said first and second support structures on said at least one mounting apparatus, by positioning grooves, located on said first and second support structures, on said mounting structures; and

affixing one of said first and second support structures to said mounting apparatus.

28. (Original): The method of claim 27, wherein prior to said affixing, said first and second support structures are moved along said mounting structures to align said plurality of first optical fibers with said plurality of second optical fibers.

29. (Canceled.)

30. (Canceled.)

31. (Canceled.)

32. (Currently Amended): ~~The optical switch assembly of claim 31,~~ An optical switch assembly comprising:

a mounting apparatus wherein said mounting apparatus comprises a plurality of mounting structures which comprise at least one member chosen from rails, fibers, and spheres and wherein a respective mounting structure is engaged with a respective second groove of the fixed and movable arrays and wherein said mounting apparatus comprises a substrate;

a fixed optical array comprising at least one chip with a plurality of first and second grooves, said fixed optical array being immobile relative to said mounting apparatus;

a movable optical array comprising at least one chip with a plurality of first and second grooves, said movable optical array being movable along said mounting apparatus along the direction of the longitudinal axis of a selected one of said second grooves of the movable array;

a plurality of first optical fibers mounted in said first grooves of said fixed optical array; and

a plurality of second optical fibers mounted in said first grooves of said movable optical array.

33. (Previously Presented): The optical switch assembly of claim 32, wherein said rails are integral with said substrate.

34. (Previously Presented): The optical switch assembly of claim 33, wherein said rails have a rectangular profile.

35. (Previously Presented): The optical switch assembly of claim 33, wherein said rails have a semi-circular profile.

36. (Previously Presented): The optical switch assembly of claim 33, wherein when said chips are mounted on said substrate and wherein said first and second grooves are on a surface of said chips closest to said substrate.

37. (Previously Presented): The optical switch assembly of claim 32, wherein said substrate comprises a plurality of first grooves.

38. (Previously Presented): The optical switch assembly of claim 37, wherein said mounting structures comprise fibers affixed to said plurality of first grooves in said substrate.

39. (Previously Presented): The optical switch assembly of claim 37, wherein said mounting structures comprise a first plurality of spheres affixed to said first grooves in said substrate and a second plurality of movable spheres positioned within said first grooves in said substrate, said fixed optical array being mounted on said affixed spheres and said movable optical array being mounted on said movable spheres.

40. (Currently Amended): The optical switch assembly of claim ~~31~~32, wherein said substrate comprises a first plurality of grooves and a second plurality of grooves extending in a transverse direction to said first plurality of grooves.

41. (Previously Presented): The optical switch assembly of claim 40, comprising first mounting structures positioned in said substrate first plurality of grooves, said fixed optical array being affixed to said first mounting structures.

42. (Previously Presented): The optical switch assembly of claim 41, comprising second mounting structures in said substrate second plurality of grooves, said movable optical array being movable on said second mounting structures.

43. (Currently Amended): An optical switch assembly comprising:

- a first waveguide holding member holding an optical waveguide, the optical waveguide having an endface disposed at an angle relative to the optical axis of the waveguide such that an axial ray incident on the endface substantially undergoes total internal reflection when the switch is in the open position;
- a second waveguide holding member holding an optical waveguide, the optical waveguide of the second waveguide holding member having an endface disposed at an angle relative to the optical axis of the waveguide of the second waveguide holding member such that an axial ray incident on the endface of the waveguide of the second waveguide holding member substantially undergoes total internal reflection when the switch is in the open position; and
- a base comprising a mounting structure ~~onto which~~ movably attached to the first and second waveguide holding members ~~are disposed~~ so that at least a selected one of the first and second waveguide holding members may be moved relative to the other waveguide holding member along a selected path to effect switching of the switch.

44. (Previously Presented): The optical switch according to claim 43, wherein the endface of the optical waveguide of the first waveguide holding member is disposed in a plane parallel to the plane containing the endface of the optical waveguide of the second waveguide holding member.

45. (Previously Presented): The optical switch according to claim 44, wherein the selected waveguide holding member is movable relative to the other waveguide holding member so that the respective waveguide end faces of the first and second waveguide holding members may be positioned sufficiently close so as to frustrate the total internal reflection at the waveguide end faces to effect optical coupling between the optical waveguides of the first and second waveguide holding members.

46. (Previously Presented): The optical switch according to claim 45, wherein the selected waveguide holding member is slidably disposed on the mounting structure.

47. (Previously Presented): The optical switch according to claim 45, wherein the optical axes of the optical waveguides are collinear.

48. (Previously Presented): The optical switch according to claim 45, wherein the mounting structure comprises at least one protrusion and the waveguide holding members each comprise a groove slidably engaged with the protrusion.

49. (Previously Presented): The optical switch according to claim 48, wherein the protrusion comprises at least one member chosen from a rail, a sphere, and a fiber.

50. (Previously Presented): The optical switch according to claim 45, wherein the waveguide holding members each comprise at least one protrusion and the mounting structure comprises a groove engaged with the protrusions.

51. (Previously Presented): The optical switch according to claim 50, wherein the protrusion comprises at least one member chosen from a rail, a sphere, and a fiber.

52. (Previously Presented): The optical switch according to claim 45, wherein the path extends along the direction of the optical axis of the optical waveguide of the first waveguide holding member.

53. (Previously Presented): The optical switch according to claim 45, wherein the path extends along a direction perpendicular to the optical axis of the optical waveguide of the first waveguide holding member.

54. (Previously Presented): The optical switch according to claim 45, wherein the first and second waveguide holding members each comprise a micromachined silicon chip.

55. (Previously Presented): The optical switch according to claim 54, wherein the waveguides of each waveguide holding member comprise an optical fiber and the silicon chips each comprise a V-groove in which a respective one of the optical fibers is disposed.

56. (Previously Presented): The optical switch according to claim 54, wherein the silicon chips each comprise a V-groove disposed in engagement with the mounting structure.

57. (Previously Presented): The optical switch according to claim 56, wherein the mounting structure comprises at least one member chosen from a rail, a sphere, and a fiber.

58. (Previously Presented): The optical switch according to claim 56, wherein the base comprises a V-groove silicon chip and the mounting structure comprises at least one of a sphere or a fiber disposed in the V-groove of the base.